A Systematic Review of Digital Technology Adoption in Off-Site Construction: Current Status and Future Direction towards Industry 4.0

Year: 2020 | Citations: 276 | Authors: Mudan Wang, C. Wang, S. Sepasgozar, S. Zlatanova

Abstract

Off-site construction (OSC) is known as an efficient construction method that could save time and cost, reduce waste of resources, and improve the overall productivity of projects. Coupled with digital technologies associated with the Industry 4.0 concept, OSC can offer a higher rate of productivity and safety. While there is a rich literature focusing on both OSC and Industry 4.0, the implementation of associated digital technologies in the OSC context has not been fully evaluated. This paper intends to evaluate the current literature of digital technology applications in OSC. Scientometric analyses and a systematic review were carried out evaluating fifteen typical digital technologies adopted by OSC projects, including building information modelling (BIM), radio frequency identification devices (RFID), global positioning systems (GPS), the Internet of Things (IoT), geographic information systems (GIS), sensors, augmented reality (AR), virtual reality (VR), photogrammetry, laser scanning, artificial intelligence (AI), 3D printing, robotics, big data, and blockchain. This review formulates a clear picture of the current practice of these digital technologies and summarizes the main area of application and limitations of each technology when utilized in OSC. The review also points out their potential and how they can be better adopted to improve OSC practice in the future.